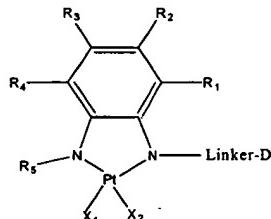


CLAIMS

1. A composition comprising the formula:



wherein:

R_1-R_5 may be the same or different and are independently selected from the group consisting of

5 H, alkyl (1 to 10 carbon atoms), benzyl, sulfonate, phosphonate, NO_2 , CF_3 , halogen, $O-R_6$, $-(C=O)OR_6$, or $-OCH_2(C=O)R_6$ and a salt, wherein R_6 is a straight or branched, saturated or unsaturated, substituted or unsubstituted alkyl having 1-10 carbons;

X₁ and X₂ may be the same or different and X is a leaving group; and

linker is a moiety joining a nitrogen to a detectable marker, D.

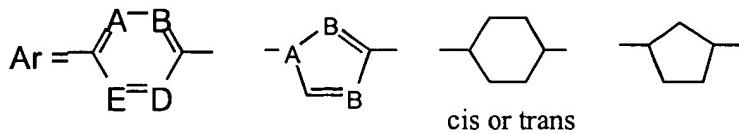
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10 2. The composition of claim 1, wherein said leaving group is selected from the group consisting of NO_3 , halogen CN, $OCOR_7$, $OCO\text{-Phenyl}$, $OCOCH_2OC(\text{Phenyl})_3$, O-Trityl and 3,5 – demethyl-phenyl-4-sulfate, wherein R_7 is selected from the group consisting of H, methyl, benzyl, sulfonate, phosphonate, NO_2 , CF_3 , halogen, $O-R_6$, $-(C=O)OR_6$, $-OCH_2(C=O)R_6$ and a salt.

15 3. The composition of claim 1 wherein said linker is selected from the group consisting of:

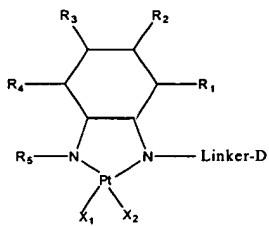
$(CH_2)_n$, $(CH_2)_n(CH=CH)_mO(CH=CH)_p(CH_2)_q$, $CO(CH_2)_n(CH=CH)_m(CH_2)_p$, $COAr(CH_2)_n(CH=CH)_m(CH_2)_p$, $NH_2(CH_2)_nQ$, $NH_2((CH_2)_nO)_m(CH_2)_tQ$, $NH_2(CH_2)_mAr(CH_2)_nQ$, wherein m, n, p, q and t are integers from 0 to 8, inclusive, and m, n, p, q and t are the same or different, wherein Q is selected from the group consisting of

20 CONH, NHCO, -S-S-, NHCSNH, NHCSO, wherein



and A, B, D, and E are the same or different and are selected from the group consisting of CH, N, O and S.

4. The composition of claim 1 wherein the detectable marker, D, is selected from the group consisting of a fluorophore, a chromophore, a radiolabel, an enzyme and an affinity tag.
5. A nucleic acid comprising a composition of claim 1.
6. The nucleic acid of claim 5 wherein said composition forms a non-covalent adduct with said nucleic acid.
7. A probe comprising a composition of claim 1.
8. A method of labeling a nucleic acid, said method comprising the step of contacting a composition of claim 1 with said nucleic acid.
9. A method of probing a nucleic acid array, said method comprising the steps of contacting said array with a probe of claim 6 and detecting signal from said detectable marker.
10. A composition comprising the formula:



15 wherein:

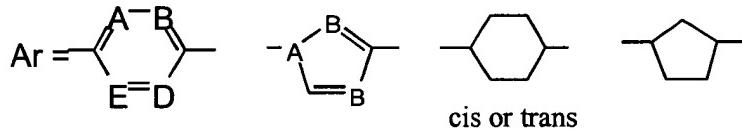
R₁- R₅ may be the same or different and are independently selected from the group consisting of H, methyl, benzyl, sulfonate, phosphonate, NO₂, CF₃, halogen, O-R₆, -(C=O)OR₆, or -OCH₂(C=O)R₆ and a salt, wherein R₆ is a straight or branched, saturated or unsaturated, substituted or unsubstituted alkyl having 1-10 carbons;

20 X₁ and X₂ may be the same or different and X is a leaving group; and

linker is a moiety joining a nitrogen to a detectable marker, D.

11. The composition of claim 10, wherein said leaving group is selected from the group consisting of NO_3 , halogen, CN, OCOR_7 , OCO-Phenyl, $\text{OCOCH}_2\text{OC}(\text{Phenyl})_3$, O-Trityl and 3,5-dimethyl-phenyl-4-sulfate, wherein R_7 is selected from the group consisting of H, methyl, 5 benzyl, sulfonate, phosphonate, NO_2 , CF_3 , halogen, $\text{O}-\text{R}_6$, $-(\text{C}=\text{O})\text{OR}_6$, $-\text{OCH}_2(\text{C}=\text{O})\text{R}_6$ and a salt.

12. The composition of claim 10 wherein said linker is selected from the group consisting of: $(\text{CH}_2)_n$, $(\text{CH}_2)_n(\text{CH}=\text{CH})_m\text{O}(\text{CH}=\text{CH})_p(\text{CH}_2)_q$, $\text{CO}(\text{CH}_2)_n(\text{CH}=\text{CH})_m(\text{CH}_2)_p$, $\text{COAr}(\text{CH}_2)_n(\text{CH}=\text{CH})_m(\text{CH}_2)_p$, $\text{NH}_2(\text{CH}_2)_n\text{Q}$, $\text{NH}_2((\text{CH}_2)_n\text{O})_m(\text{CH}_2)_t\text{Q}$, $\text{NH}_2(\text{CH}_2)_m\text{Ar}(\text{CH}_2)_n\text{Q}$, wherein m, n, p, q and t are integers from 0 to 8, inclusive, and m, n, 10 p, q and t are the same or different, wherein Q is selected from the group consisting of CONH, NHCO, -S-S-, NHCSNH, NHCSO, wherein



15 and A, B, D, and E are the same or different and are selected from the group consisting of CH, N, O and S.

13. The composition of claim 10 wherein the detectable marker, D, is selected from the group consisting of a fluorophore, a chromophore, a radiolabel, an enzyme and an affinity tag.

14. A nucleic acid comprising a composition of claim 10.

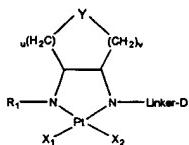
15. The nucleic acid of claim 14 wherein said composition forms a non-covalent adduct with said 20 nucleic acid.

16. A probe comprising a composition of claim 10.

17. A method of labeling a nucleic acid, said method comprising the step of contacting a composition of claim 10 with said nucleic acid.

25 18. A method of probing a nucleic acid array, said method comprising the steps of contacting said array with a probe of claim 15 and detecting signal from said detectable marker.

19. A composition comprising the formula:



wherein

Y is selected from the group consisting of O, S, and C;

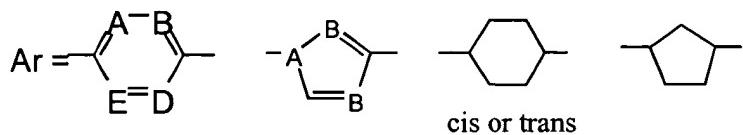
R₁ is selected from the group consisting of H, methyl, benzyl, sulfonate, phosphonate, NO₂, CF₃,

- 5 halogen, O-R₂, -(C=O)OR₂, -OCH₂(C=O)R₂, and a salt, wherein R₂ is a straight or branched, saturated or unsaturated, substituted or unsubstituted alkyl having 1-10 carbons;

X₁ and X₂ are the same or different and X is a leaving group;

linker is a moiety joining a nitrogen to a detectable marker, D, and u and v are the same or different and are an integer from 1 to 10.

- 10 20. The composition of claim 19, wherein said leaving group is selected from the group consisting of NO₃, halogen, CN, OCOR₃, OCO-Phenyl, OCOCH₂OC(Phenyl)₃, O-Trityl and 3,5-dimethyl-phenyl-4-sulfate, wherein R₃ is selected from the group consisting of H, methyl, benzyl, sulfonate, phosphonate, NO₂, CF₃, halogen, O-R₂, -(C=O)OR₂, or -OCH₂(C=O)R₂ and a salt.
- 15 21. The composition of claim 19 wherein said linker is selected from the group consisting of: (CH₂)_n, (CH₂)_n(CH=CH)_mO(CH=CH)_p(CH₂)_q, CO(CH₂)_n(CH=CH)_m(CH₂)_p, COAr(CH₂)_n(CH=CH)_m(CH₂)_p, NH₂(CH₂)_nQ, NH₂((CH₂)_nO)_m(CH₂)_tQ, NH₂(CH₂)_mAr(CH₂)_nQ, wherein m, n, p, q and t are integers from 0 to 8, inclusive, and m, n, p, q and t are the same or different, wherein Q is selected from the group consisting of CONH, NHCO, -S-S-, NHCSNH, NHCSO, wherein
- 20



and A, B, D, and E are the same or different and are selected from the group consisting of CH, N, O and S.

22. The composition of claim 19 wherein said detectable marker, D, is selected from the group consisting of a fluorophore, a chromophore, a radiolabel, an enzyme and an affinity tag.

5 23. A nucleic acid comprising a composition of claim 19.

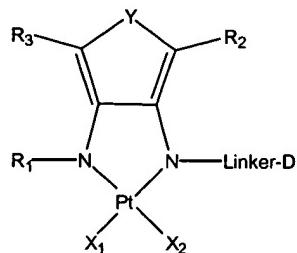
24. The nucleic acid of claim 23 wherein said composition forms a non-covalent adduct with said nucleic acid.

25. A probe comprising a composition of claim 19.

26. A method of labeling a nucleic acid, said method comprising the step of contacting a composition of claim 19 with said nucleic acid.

10 27. A method of probing a nucleic acid array, said method comprising the steps of contacting said array with a probe of claim 25 and detecting signal from said detectable marker.

28. A composition comprising the formula:



15 wherein:

-Y is selected from the group consisting of O, S, and C;

R₁-R₃ may be the same or different and are independently selected from the group consisting of H, methyl, benzyl, sulfonate, phosphonate, NO₂, CF₃, halogen, O-R₄, -(C=O)OR₄, or -OCH₂(C=O)R₄ and a salt, wherein R₄ is a straight or branched, saturated or unsaturated, 20 substituted or unsubstituted alkyl having 1-10 carbons;

X_1 and X_2 are the same or different and X is a leaving group; and

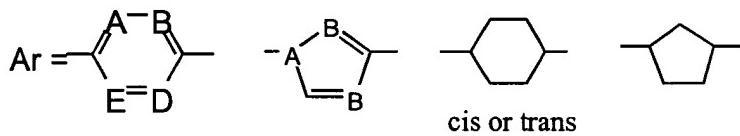
linker is a moiety joining a nitrogen to a detectable marker, D.

29. The composition of claim 28, wherein said leaving group is selected from the group consisting of NO_3 , halogen, CN, OCOR_5 , OCO-Phenyl, $\text{OCOCH}_2\text{OC}(\text{Phenyl})_3$, O-Trityl and 3,5-dimethyl-phenyl-4-sulfate wherein R_5 is selected from the group consisting of H, methyl, benzyl, sulfonate, phosphonate, NO_2 , CF_3 , halogen, O- R_4 , -(C=O)OR₄, -OCH₂(C=O)R₄ and a salt.

30. The composition of claim 28 wherein said linker is selected from the group consisting of:

$(CH_2)_n$, $(CH_2)_n(CH=CH)_mO(CH=CH)_p(CH_2)_q$, $CO(CH_2)_n(CH=CH)_m(CH_2)_p$,

- COAr(CH₂)_n(CH=CH)_m(CH₂)_p, NH₂(CH₂)_nQ, NH₂((CH₂)_nO)_m(CH₂)_tQ,
 NH₂(CH₂)_mAr(CH₂)_nQ, wherein m, n, p, q and t are integers from 0 to 8, inclusive, and m, n,
 p, q and t are the same or different, wherein Q is selected from the group consisting of
 CONH, NHCO, -S-S-, NHCSNH, NHCSO, wherein



and A, B, D, and E are the same or different and are selected from the group consisting of CH, N, O and S.

31. The composition of claim 28 wherein said detectable marker, D, is selected from the group consisting of a fluorophore, a chromophore, a radiolabel, an enzyme and an affinity tag.

- 20 32. A nucleic acid comprising a composition of claim 28.

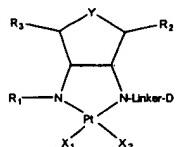
33. The nucleic acid of claim 32 wherein said composition forms a non-covalent adduct with said nucleic acid.

34. A probe comprising a composition of claim 28.

35. A method of labeling a nucleic acid, said method comprising the step of contacting a composition of claim 28 with said nucleic acid.

36. A method of probing a nucleic acid array, said method comprising the steps of contacting said array with a probe of claim 34 and detecting signal from said detectable marker.

37. A composition comprising the formula:



5 wherein:

Y is selected from the group consisting of O, S, and C;

R₁-R₃ may be the same or different and are independently selected from the group consisting of H, methyl, benzyl, sulfonate, phosphonate, NO₂, CF₃, halogen, O-R₄, -(C=O)OR₄, or -OCH₂(C=O)R₄ and a salt, wherein R₄ is a straight or branched, saturated or unsaturated, substituted or unsubstituted alkyl having 1-10 carbons;

X₁ and X₂ are the same or different and X is a leaving group; and

linker is a moiety joining a nitrogen to a detectable marker, D.

38. The composition of claim 37, wherein said leaving group is selected from the group

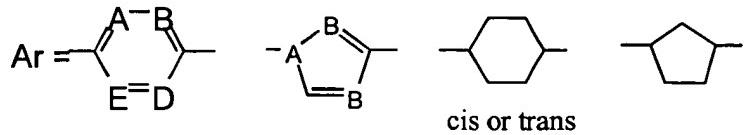
15 consisting of NO₃, halogen, CN, OCOR₅, OCO-Phenyl, OCOCH₂OC(Phenyl)₃, O-Trityl and 3,5-dimethyl-phenyl-4-sulfate, wherein R₅ is selected from the group consisting of H, methyl, benzyl, sulfonate, phosphonate, NO₂, CF₃, halogen, O-R₄, -(C=O)OR₄, -OCH₂(C=O)R₄ and a salt.

39. The composition of claim 37 wherein said linker is selected from the group consisting of:

20 (CH₂)_n, (CH₂)_n(CH=CH)_mO(CH=CH)_p(CH₂)_q, CO(CH₂)_n(CH=CH)_m(CH₂)_p, COAr(CH₂)_n(CH=CH)_m(CH₂)_p, NH₂(CH₂)_nQ, NH₂((CH₂)_nO)_m(CH₂)_tQ, NH₂(CH₂)_mAr(CH₂)_nQ, wherein m, n, p, q and t are integers from 0 to 8, inclusive, and m, n,

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p, q and t are the same or different, wherein Q is selected from the group consisting of CONH, NHCO, -S-S-, NHCSNH, NHCSO, wherein



5 and A, B, D, and E are the same or different and are selected from the group consisting of CH, N, O and S.

40. The composition of claim 37 wherein said detectable marker, D, is selected from the group consisting of a fluorophore, a chromophore, a radiolabel, an enzyme and an affinity tag.

41. A nucleic acid comprising a composition of claim 37.

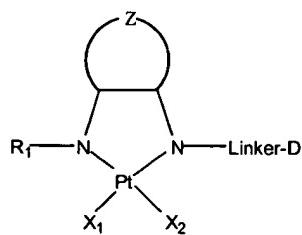
10 42. The nucleic acid of claim 41 wherein said composition forms a non-covalent adduct with said nucleic acid.

43. A probe comprising a composition of claim 37.

44. A method of labeling a nucleic acid, said method comprising the step of contacting a composition of claim 37 with said nucleic acid.

15 45. A method of probing a nucleic acid array, said method comprising the steps of contacting said array with a probe of claim 43 and detecting signal from said detectable marker.

46. A composition comprising the formula



wherein

Z is selected from the group consisting of $(CH_2)_n$, and $(CH_2)_nO(CH_2)_m$, wherein m and n are integers from 2 to 8, inclusive;

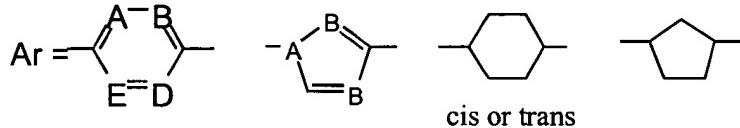
- R₁ is selected from the group consisting of H, methyl, benzyl, sulfonate, phosphonate, NO₂, CF₃, halogen, O-R₂, -(C=O)OR₂, or -OCH₂(C=O)R₂ and a salt, wherein R₂ is a straight or branched, 5 saturated or unsaturated, substituted or unsubstituted alkyl having 1-10 carbons;

X₁ and X₂ are the same or different and X is a leaving group; and

linker is a moiety joining a nitrogen to a detectable marker, D.

47. The composition of claim 46, wherein said leaving group is selected from the group consisting of No₃, halogen, CN, OCOR₃, OCO-Phenyl, OCOCH₂OC(Phenyl)₃, O-Trityl and 10 3,5-dimethyl-phenyl-4-sulfate, wherein R₃ is selected from the group consisting of H, methyl, benzyl, sulfonate, phosphonate, NO₂, CF₃, halogen, O-R₂, -(C=O)OR₂, -OCH₂(C=O)R₂ and a salt.

48. The composition of claim 46 wherein said linker is selected from the group consisting of: 15 $(CH_2)_n$, $(CH_2)_n(CH=CH)_mO(CH=CH)_p(CH_2)_q$, CO(CH₂)_n(CH=CH)_m(CH₂)_p, COAr(CH₂)_n(CH=CH)_m(CH₂)_p, NH₂(CH₂)_nQ, NH₂((CH₂)_nO)_m(CH₂)_tQ, NH₂(CH₂)_mAr(CH₂)_nQ, wherein m, n, p, q and t are integers from 0 to 8, inclusive, and m, n, p, q and t are the same or different, wherein Q is selected from the group consisting of CONH, NHCO, -S-S-, NHCSNH, NHCSO, wherein



and A, B, D, and E are the same or different and are selected from the group consisting of CH, N, O and S.

49. The composition of claim 46 wherein said detectable marker, D, is selected from the group consisting of a fluorophore, a chromophore, a radiolabel, an enzyme and an affinity tag.

- 25 50. A nucleic acid comprising a composition of claim 46.

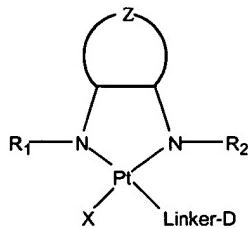
51. The nucleic acid of claim 50 wherein said composition forms a non-covalent adduct with said nucleic acid.

52. A probe comprising a composition of claim 46.

53. A method of labeling a nucleic acid, said method comprising the step of contacting a composition of claim 46 with said nucleic acid.

54. A method of probing a nucleic acid array, said method comprising the steps of contacting said array with a probe of claim 52 and detecting signal from said detectable marker.

55. A composition comprising the formula



wherein

10 Z is selected from the group consisting of (CH₂)_n, and (CH₂)_nO(CH₂)_m, wherein m and n are integers from 2 to 8, inclusive;

15 R₁ and R₂ may be the same or different and are selected from the group consisting of H, methyl, benzyl, sulfonate, phosphonate, NO₂, CF₃, halogen, O-R₃, -(C=O)OR₃, or -OCH₂(C=O)R₃ and a salt, wherein R₃ is a straight or branched, saturated or unsaturated, substituted or unsubstituted alkyl having 1-10 carbons;

X₁ is a leaving group; and

linker is a moiety joining a detectable marker, D to the platinum ion.

20 56. The composition of claim 55, wherein said leaving group is selected from the group consisting of NO₃, halogen, CN, OCOR₄, OCO-Phenyl, OCOCH₂OC(Phenyl)₃, O-Trityl and 3,5-dimethyl-phenyl-4-sulfate, wherein R₄ is selected from the group consisting of H, methyl,

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benzyl, sulfonate, phosphonate, NO_2 , CF_3 , halogen, $\text{O}-\text{R}_3$, $-(\text{C}=\text{O})\text{OR}_3$, $-\text{OCH}_2(\text{C}=\text{O})\text{R}_3$ and a salt.

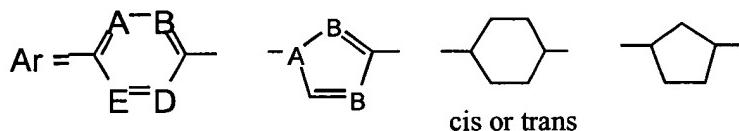
57. The composition of claim 55 wherein said linker is selected from the group consisting of:

$(\text{CH}_2)_n$, $(\text{CH}_2)_n(\text{CH}=\text{CH})_m\text{O}(\text{CH}=\text{CH})_p(\text{CH}_2)_q$, $\text{CO}(\text{CH}_2)_n(\text{CH}=\text{CH})_m(\text{CH}_2)_p$,

5 $\text{COAr}(\text{CH}_2)_n(\text{CH}=\text{CH})_m(\text{CH}_2)_p$, $\text{NH}_2(\text{CH}_2)_n\text{Q}$, $\text{NH}_2((\text{CH}_2)_n\text{O})_m(\text{CH}_2)_t\text{Q}$,

$\text{NH}_2(\text{CH}_2)_m\text{Ar}(\text{CH}_2)_n\text{Q}$, wherein m, n, p, q and t are integers from 0 to 8, inclusive, and m, n, p, q and t are the same or different, wherein Q is selected from the group consisting of

CONH, NHCO, -S-S-, NHCSNH, NHCSO, wherein



and A, B, D, and E are the same or different and are selected from the group consisting of CH, N, O and S.

58. The composition of claim 55 wherein said detectable marker, D, is selected from the group consisting of a fluorophore, a chromophore, a radiolabel, an enzyme and an affinity tag.

15 59. A nucleic acid comprising a composition of claim 55.

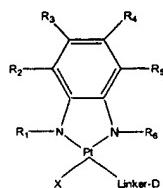
60. The nucleic acid of claim 59 wherein said composition forms a non-covalent adduct with said nucleic acid.

61. A probe comprising a composition of claim 55.

20 62. A method of labeling a nucleic acid, said method comprising the step of contacting a composition of claim 55 with said nucleic acid.

63. A method of probing a nucleic acid array, said method comprising the steps of contacting said array with a probe of claim 61 and detecting signal from said detectable marker.

64. A composition comprising the formula:



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wherein:

R₁-R₆ may be the same or different and are independently selected from the group consisting of H, methyl, benzyl, sulfonate, phosphonate, NO₂, CF₃, halogen, O-R₇, -(C=O)OR₇, or -OCH₂(C=O)R₇ and a salt, wherein R₇ is a straight or branched, saturated or unsaturated,

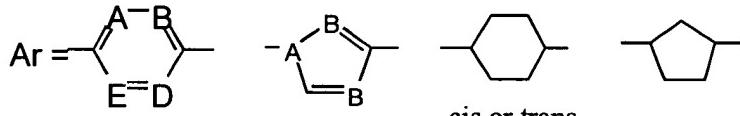
5 substituted or unsubstituted alkyl having 1-10 carbons;

X is a leaving group; and

linker is a moiety joining a detectable marker, D to the platinum ion.

65. The composition of claim 64, wherein said leaving group is selected from the group consisting of No₃, halogen, CN, OCOR₈, OCO-Phenyl, OCOCH₂OC(Phenyl)₃, O-Trityl and
10 3,5-dimethyl-phenyl-4-sulfate, wherein R₈ is selected from the group consisting of H, methyl, benzyl, sulfonate, phosphonate, NO₂, CF₃, halogen, O-R₇, -(C=O)OR₆, -OCH₂(C=O)R₇ and a salt.

66. The composition of claim 64 wherein said linker is selected from the group consisting of:
15 (CH₂)_n, (CH₂)_n(CH=CH)_mO(CH=CH)_p(CH₂)_q, CO(CH₂)_n(CH=CH)_m(CH₂)_p,
COAr(CH₂)_n(CH=CH)_m(CH₂)_p, NH₂(CH₂)_nQ, NH₂((CH₂)_nO)_m(CH₂)_tQ,
NH₂(CH₂)_mAr(CH₂)_nQ, wherein m, n, p, q and t are integers from 0 to 8, inclusive, and m, n,
p, q and t are the same or different, wherein Q is selected from the group consisting of
CONH, NHCO, -S-S-, NHCSNH, NHCSO, wherein



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and A, B, D, and E are the same or different and are selected from the group consisting of CH, N, O and S.

67. The composition of claim 64 wherein the detectable marker, D, is selected from the group consisting of a fluorophore, a chromophore, a radiolabel, an enzyme and an affinity tag.

25 68. A nucleic acid comprising a composition of claim 64.

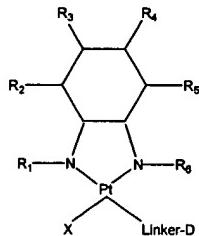
69. The nucleic acid of claim 68 wherein said composition forms a non-covalent adduct with said nucleic acid.

70. A probe comprising a composition of claim 64.

71. A method of labeling a nucleic acid, said method comprising the step of contacting a
5 composition of claim 67 with said nucleic acid.

72. A method of probing a nucleic acid array, said method comprising the steps of contacting said array with a probe of claim 70 and detecting signal from said detectable marker.

73. A composition comprising the formula



wherein

10 R₁-R₆ may be the same or different and are independently selected from the group consisting of H, methyl, benzyl, sulfonate, phosphonate, NO₂, CF₃, halogen, O-R₇, -(C=O)OR₇, or -OCH₂(C=O)R₇ and a salt, wherein R₇ is a straight or branched, saturated or unsaturated, substituted or unsubstituted alkyl having 1-10 carbons;

X is a leaving group; and

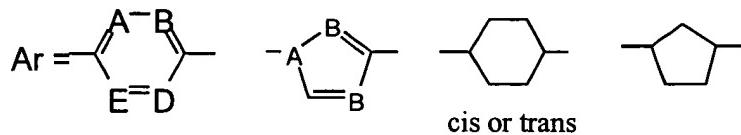
15 linker is a moiety joining a detectable marker, D, to the platinum ion.

74. The composition of claim 73, wherein said leaving group is selected from the group consisting of ~~NO₃~~, halogen, CN, OCOR₈, OCO-Phenyl, OCOCH₂OC(Phenyl)₃, O-Trityl and 3,5-dimethyl-phenyl-4-sulfate, wherein R₈ is selected from the group consisting of H, methyl, benzyl, sulfonate, phosphonate, NO₂, CF₃, halogen, O-R₇, -(C=O)OR₆, -OCH₂(C=O)R₇ and a
20 salt.

75. The composition of claim 73 wherein said linker is selected from the group consisting of: (CH₂)_n, (CH₂)_n(CH=CH)_mO(CH=CH)_p(CH₂)_q, CO(CH₂)_n(CH=CH)_m(CH₂)_p,

COAr(CH₂)_n(CH=CH)_m(CH₂)_p, NH₂(CH₂)_nQ, NH₂((CH₂)_nO)_m(CH₂)_tQ,
 NH₂(CH₂)_mAr(CH₂)_nQ, wherein m, n, p, q and t are integers from 0 to 8, inclusive, and m, n,
 p, q and t are the same or different, wherein Q is selected from the group consisting of
 CONH, NHCO, -S-S-, NHCSNH, NHCSO, wherein

5



and A, B, D, and E are the same or different and are selected from the group consisting of CH, N, O and S.

76. The composition of claim 73 wherein the detectable marker, D, is selected from the group 10 consisting of a fluorophore, a chromophore, a radiolabel, an enzyme and an affinity tag.

77. A nucleic acid comprising a composition of claim 73.

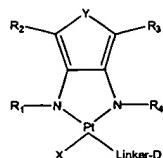
78. The nucleic acid of claim 77 wherein said composition forms a non-covalent adduct with said nucleic acid.

79. A probe comprising a composition of claim 73.

15 80. A method of labeling a nucleic acid, said method comprising the step of contacting a composition of claim 73 with said nucleic acid.

81. A method of probing a nucleic acid array, said method comprising the steps of contacting said array with a probe of claim 79 and detecting signal from said detectable marker.

82. A composition comprising the formula:



20 wherein

Y is selected from the group consisting of O, S, and C;

R_1 - R_4 may be the same or different and are independently selected from the group consisting of H, methyl, benzyl, sulfonate, phosphonate, NO_2 , CF_3 , halogen, $O-R_5$, $-(C=O)OR_5$, or $-OCH_2(C=O)R_5$ and a salt, wherein R_5 is a straight or branched, saturated or unsaturated, substituted or unsubstituted alkyl having 1-10 carbons;

- 5 X is a leaving group; and

linker is a moiety joining a detectable marker, D, to the platinum ion.

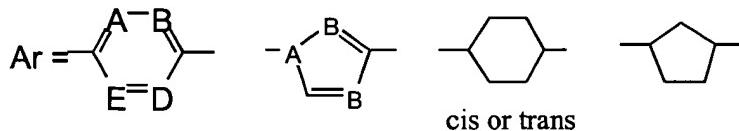
83. The composition of claim 82 wherein said leaving group is selected from the group consisting of NO_3 , halogen, CN, OCOR₆, OCO-Phenyl, OCOCH₂OC(Phenyl)₃, O-Trityl and 3,5-dimethyl-phenyl-4-sulfate, wherein R₆ is selected from the group consisting of H, methyl, benzyl, sulfonate, phosphonate, NO₂, CF₃, halogen, O-R₅, -(C=O)OR₅, -OCH₂(C=O)R₅ and a salt.

84. The composition of claim 82 wherein said linker is selected from the group consisting of:

$(CH_2)_n$, $(CH_2)_n(CH=CH)_mO(CH=CH)_p(CH_2)_q$, $CO(CH_2)_n(CH=CH)_m(CH_2)_p$,

$\text{COAr}(\text{CH}_2)_n(\text{CH}=\text{CH})_m(\text{CH}_2)_p$, $\text{NH}_2(\text{CH}_2)_n\text{Q}$, $\text{NH}_2((\text{CH}_2)_n\text{O})_m(\text{CH}_2)_l\text{Q}$,

- 15 $\text{NH}_2(\text{CH}_2)_m\text{Ar}(\text{CH}_2)_n\text{Q}$, wherein m, n, p, q and t are integers from 0 to 8, inclusive, and m, n, p, q and t are the same or different, wherein Q is selected from the group consisting of CONH, NHCO, -S-S-, NHCSNH, NHCSO, wherein



- 20 and A, B, D, and E are the same or different and are selected from the group consisting of CH, N, O and S.

85. The composition of claim 82 herein the detectable marker, D, is selected from the group consisting of a fluorophore, a chromophore, a radiolabel, an enzyme and an affinity tag.

86. nucleic acid comprising a composition of claim 82.

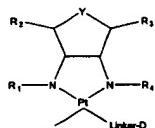
- 25 87. The nucleic acid of claim 86 wherein said composition forms a non-covalent adduct with said
nucleic acid.

88. A probe comprising a composition of claim 82.

89. A method of labeling a nucleic acid, said method comprising the step of contacting a composition of claim 82 with said nucleic acid.

90. A method of probing a nucleic acid array, said method comprising the steps of contacting said array with a probe of claim 88 and detecting signal from said detectable marker.

91. A composition comprising the formula:



wherein

Y is selected from the group consisting of O, S, and C;

R_1 - R_4 may be the same or different and are independently selected from the group consisting of H, methyl, benzyl, sulfonate, phosphonate, NO_2 , CF_3 , halogen, $O-R_5$, $-(C=O)OR_5$, or $-OCH_2(C=O)R_5$ and a salt, wherein R_5 is a straight or branched, saturated or unsaturated, substituted or unsubstituted alkyl having 1-10 carbons;

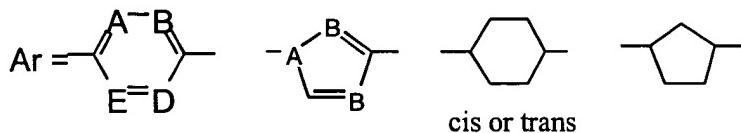
X is a leaving group; and

linker is a moiety joining a detectable marker, D, to the platinum ion.

15 92. The composition of claim 91, wherein said leaving group is selected from the group consisting of NO_3 , halogen, CN, OCOR₆, OCO-Phenyl, OCOCH₂OC(Phenyl)₃, O-Trityl and 3,5-dimethyl-phenyl-4-sulfate, wherein R₆ is selected from the group consisting of H, methyl, benzyl, sulfonate, phosphonate, NO₂, CF₃, halogen, O-R₅, -(C=O)OR₅, -OCH₂(C=O)R₅ and a salt.

20 93. The composition of claim 91 wherein said linker is selected from the group consisting of:
 $(CH_2)_n$, $(CH_2)_n(CH=CH)_mO(CH=CH)_p(CH_2)_q$, $CO(CH_2)_n(CH=CH)_m(CH_2)_p$,
 $COAr(CH_2)_n(CH=CH)_m(CH_2)_p$, $NH_2(CH_2)_nQ$, $NH_2((CH_2)_nO)_m(CH_2)_tQ$,
 $NH_2(CH_2)_mAr(CH_2)_nQ$, wherein m, n, p, q and t are integers from 0 to 8, inclusive, and m, n,

p, q and t are the same or different, wherein Q is selected from the group consisting of CONH, NHCO, -S-S-, NHCSNH, NHCSO, wherein



5 and A, B, D, and E are the same or different and are selected from the group consisting of CH, N, O and S.

94. The composition of claim 91 wherein the detectable marker, D, is selected from the group consisting of a fluorophore, a chromophore, a radiolabel, an enzyme and an affinity tag.

95. A nucleic acid comprising a composition of claim 91.

- 10 96. The nucleic acid of claim 95 wherein said composition forms a non-covalent adduct with said nucleic acid.
97. A probe comprising a composition of claim 91.
98. A method of labeling a nucleic acid, said method comprising the step of contacting a composition of claim 91 with said nucleic acid.
- 15 99. A method of probing a nucleic acid array, said method comprising the steps of contacting said array with a probe of claim 97 and detecting signal from said detectable marker.
100. A method of making a platinum labeling compound that comprises a stabilizing bridge, the method comprising the step of contacting potassium tetrachloroplatinate (II) with an aliphatic diamine labeled with a detectable marker, wherein said contacting results in a cis-platinum dichloride labeling compound.
- 20 101. The method of claim 100 wherein said aliphatic diamine is a cycloaliphatic diamine.
102. The method of claim 101 wherein said cycloaliphatic diamine is a 1, 2-cycloaliphatic diamine.
103. The method of claim 101 wherein said cycloaliphatic diamine is a cyclohexyl diamine.

104. The method of claim 103 wherein said cyclohexyl diamine is a 1,2-cyclohexyl diamine.
105. The method of claim 100 wherein said contacting is performed in aqueous solution at a pH of about 1.5 to 5.5 and at a temperature of about 65°C.

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